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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/719,948	12/19/2000	Shigeru Okita	313MC/49472	5315

23911 7590 01/28/2004
CROWELL & MORING LLP
INTELLECTUAL PROPERTY GROUP
P.O. BOX 14300
WASHINGTON, DC 20044-4300

EXAMINER

NGUYEN, XUAN LAN T

ART UNIT	PAPER NUMBER
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3683

DATE MAILED: 01/28/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/719,948

Applicant(s)

OKITA ET AL.

Examiner

Lan Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 October 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-10 and 13-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 10 is/are allowed.
- 6) ☒ Claim(s) 1,2,4-9 and 13-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 24 March 2003 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 14 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 14 is rejected as an incomplete claim because it depends on cancelled base claims, 3 and 11. In order to further prosecution, claim 14 is being examined as depending from claim 1.

Claim Rejections - 35 USC § 103

3. Claims 1, 2 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wallin in view of Takemura et al. (USP 5,411,336).

Re: claim 1, Wallin shows a rolling bearing, as in the present invention, comprising: an outer ring, an inner ring, rolling elements as shown in figure 2, with a contact angle of 30 degrees in the abstract. Wallin is silent of the bearing lubrication and a roughness ratio between the races and the rolling elements to be 6 or less. Takemura et al. teach the concept of having the roughness ratio of the races to the rolling elements to be 3 or less in a lubricated bearing assembly to prevent peeling damage. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have constructed Wallin's bearing with a roughness ratio

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between the races and the rolling elements of 3 or less and to have further provided a lubrication oil as taught by Takemura et al. in order to prevent peeling damage.

Re: claim 2, Wallin shows in the abstract, the contact angle is 30 degrees.

Re: claim 7, the claimed feature is considered a design feature where the hardness of the rolling bodies and the hardness of the raceways can be designed to accommodate different applications.

4. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wallin (USP 5,273,413) in view of Takemura et al. (USP 5,411,336) and further in view of Tanaka et al. (USP 5,998,042).

Wallin's bearing, as discussed in the rejection of claim 1, is silent of the material make up of the rolling elements. Tanaka et al. teach the use of rolling elements wherein the elements are made of steel with at least 10% by weight of Cr in the abstract. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used rolling elements with the content of steel with at least 10% by weight of Cr as taught by Tanaka in order to provide strength and wear resistance to the rolling elements.

5. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wallin (USP 5,273,413) in view of Takemura et al. (USP 5,411,336) and further in view of Niizeki (JP 09229072 A).

Wallin's bearing, as discussed in the above rejection of claims 1 and 2, lacks the absent of obstacles with a mean diameter of 3 μ m or more. Niizeki teaches the concept of having a raceway surface without obstacles of mean diameter of 3 or more in

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the abstract to improve the performance of the bearing. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have construct Wallin's bearing with raceway surface without obstacles of mean diameter of 3 or more to improve the performance of the bearing as taught by Niizeki.

6. Claims 5 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wallin (USP 5,273,413) in view of Takemura et al. (USP 5,411,336) and further in view of Tsushima et al. (JP 11080923 A).

Re: claims 5 and 15, Wallin's bearing, as rejected in claim 1, lacks the nitride layer and the level of hardness. Tsushima et al. teach in the abstract the treatment of nitride on rolling elements in order to achieve a surface hardness of 1000 Hv. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided Wallin's bearing with a treatment of nitride to achieve a level of hardness to be 1000 Hv in order to increase the life and the performance of the bearing assembly as taught by Tsushima et al.

7. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wallin (USP 5,273,413) in view of Takemura et al. (USP 5,411,336), in view of Tanaka et al. (USP 5,998,042) and further in view of Niizeki et al. (JP 10103356 A).

Wallin's bearing, as discussed in the above rejections of claims 1 and 4, lacks the material and roughness of the rolling elements. Niizeki et al. teach the concept of using ceramics as a material and to set the roughness of the rolling elements to 0.005 μ m Ra to improve the performance of the bearing. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have constructed

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Wallin's bearing with ceramics which comprise a roughness of 0.005 μm Ra to improve the performance of the bearing as taught by Niizeki et al.

8. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wallin (USP 5,273,413) in view of Takemura et al. (USP 5,411,336) and further in view of Niizeki et al. (JP 10103356 A).

Wallin's bearing, as discussed in the above rejection of claim 1, lacks the material and roughness of the rolling elements. Niizeki et al. teach the concept of using ceramics as a material and to set the roughness of the rolling elements to 0.005 μm Ra to improve the performance of the bearing. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have constructed Wallin's bearing with ceramics which comprise a roughness of 0.005 μm Ra to improve the performance of the bearing as taught by Niizeki et al.

9. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Otsutake (JP 6-54921).

Otsutake shows a cage, as in the present invention, wherein said cage is formed with an advanced resin material into a circular shape with a plurality of pockets, as shown in figure 1. Otsutake show a weld line 1b wherein the size of the opening D1 is larger than the opening of D. The claimed percentages are considered design choices and would have been obvious for one of ordinary skill in the art at the time of the invention to have tried different sizes in order achieve a difference performances of the bearing assembly. Note that a conventional bearing would have an inner race, an outer race, rolling elements and lubricating oil.

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10. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Niizeki (JP 09229072 A) in view of Yasui et al. (JP 06165790 A) and further in view of Masuda et al. (USP 5,199,799).

Niizeki show a rolling bearing with an outer race 2, an inner race 3, rolling elements 4, a cage 5 wherein said cage is made of PTFE in the abstract. Niizeki lacks the chamfering on both sides of the cage and having a hole on the bottom. Yasui et al. teach the concept of chamfering the sides of the cage. Masuda et al. teach the concept of having a hole on the bottom of the cage. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Niizeki's bearing with a chamfered cage having holes on the bottom of the cage in order for lubrication to be evenly distributed within the cage as taught by Yasui and Masuda.

Allowable Subject Matter

11. Claim 10 is allowed.

Response to Arguments

12. Applicant's argument of claim 1 is not persuasive. Applicant argues that Wallin's bearing assembly is completely free of any type of lubrication because the screw compressor is used in a food or chemical industry. Wallin only discloses that "These compressors, which operate at high speeds and supply completely oil free compressed air". In column 2, lines 30-35, Wallin mentions a PUMPAC design which has a contact angle of 15 degrees that has stable oil viscosity, consistent film thickness and longer

service life. One has to wonder if there are seals or filters or other devices involved in order to keep the oil from being transmitted into the compressed air. One could conclude that Wallin does not disclose a bearing assembly, which does not have any type of lubrication. Wallin only concerns about the contact angle and is simply silent about the lubrication. Hence, a obviousness rejection is set forth combining the teaching of Takemura for the use of a lubrication and the roughness with Wallin's bearing assembly in case if Wallin's bearing is being used with seals or filters to entrap the oil or if Wallin's bearing is being used in an environment where a completely oil free compressed air is not a requirement.

13. Applicant's argument about claim 8 is more specific than the claim. Claim 8 does not claim the contact angle.

14. Applicant's argument about claim 9 is non persuasive because having multiple lubricants for a multiple effect is an obvious expedient. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used other lubricants in combination with the solid lubricant to further improve the performance of the bearing assembly.

Conclusion

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.


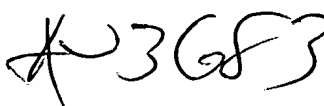
16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lan Nguyen whose telephone number is 703-308-8347. The examiner can normally be reached on M-F, 8 to 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Lavinder can be reached on 703-308-3421. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9306 for regular communications and 703-872-9306 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-306-4177.

XLN

XLN
January 23, 2004


DOUGLAS C. BUTLER
PRIMARY EXAMINER
 1/23/04